



Recent Advances in the Understanding and Intervention of Intellectual and Developmental Disabilities: A Mini Review



Fabrício Emanuel Soares de Oliveira^{1,2*}, Andrielly Gonçalves Nobre de Oliveira³ and Ludmila Ketlen Soares de Oliveira⁴

¹Montes Claros State University (Unimontes), Postgraduate Program in Health Sciences, Montes Claros, MG, Brazil

²Faculty of Health Sciences of Unai -FACISA, Psychology course, Unai, MG, Brazil

³Única College, Montes Claros, MG, Brazil

⁴FIPMoc University Center, Montes Claros, MG, Brazil

Submission: June 26, 2023; **Published:** July 31, 2023

*Corresponding author: Fabrício Emanuel Soares de Oliveira, Faculty of Health Sciences, Montes Claros State University, Avenida Domingos, Minas Gerais, Brazil, Email: fabricioemanuel1@hotmail.com

Abstract

The diagnosis of intellectual and developmental disabilities (IDD) has changed over time, adopting a broader, more precise, and inclusive conception. Similarly, knowledge about the etiology of IDD and treatment options has also evolved in recent years, with perspectives on the development of new interventions such as gene therapy, for example. In this sense, this mini-review aimed to analyze some key points in the understanding of IDD and possibilities for therapeutic interventions.

Keywords: Developmental disabilities; Autism spectrum disorder; Neurodevelopmental disorders; Mental behaviour

Mini Review

In recent years, there have been significant changes in the classification and diagnostic systems of intellectual and developmental disabilities (IDD), with emphasis on the publication of the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) [1] and the update of the ICD (International Classification of Diseases) in its latest version, the ICD-11 [2].

The transition from ICD-10 to ICD-11, which occurred in 2018, represented a significant update and improvement in the classification of IDD. ICD-11 adopted a more evidence-based and functioning-oriented approach, considering multiple dimensions including intellectual level, adaptive capacity and social participation. This approach aims to provide a more comprehensive description of individuals' abilities and limitations, valuing the biopsychosocial perspective. In this nosological manual, IDD was classified within the category of "Mental, Behavioral, or Neurodevelopmental Disorders" [2].

The DSM-5, published by the American Psychiatric Association in 2013, also brought important changes in the diagnosis of IDD.

In the classification of disorders in the DSM-5, IDD encompasses intellectual disability (ID), Communication Disorders, Autism Spectrum Disorder (ASD), Attention-Deficit/Hyperactivity Disorder (ADHD), Neurodevelopmental Motor Disorders including Tic Disorders, and Specific Learning Disorders. Both in ICD-11 and DSM-5, IDD is classified in a similar manner. Another noteworthy point is that the DSM-5 includes the specifier "associated with a known medical or genetic condition or environmental factor" [1,3].

However, the DSM-5 brought a more integrated approach by considering diagnostic criteria that combine aspects related to intellectual deficit, ASD, and other developmental disorders [1]. This reflects the current understanding that these conditions often coexist or share common characteristics, with different etiologies including genetic disorders (such as chromosomal disorders, contiguous gene deletions, and single-gene disorders), environmental causes (alcohol and other teratogens, prenatal infections), traumatic brain injury, neurological/brain disorders, nutritional deficiencies, and inborn errors of metabolism [4,5].

Significant progress has been made through genetic and neuroscientific research in understanding the biological foundations of intellectual and developmental disabilities. Genetic studies have identified genes and genetic variants associated with these conditions, providing insights into the molecular mechanisms and biological pathways involved in brain development and cognitive function [6,7]. Additionally, neuroimaging studies have contributed to the understanding of structural and functional brain differences in individuals with intellectual and developmental disabilities, revealing valuable information about the affected neural networks [8-10]. These findings have significant implications for identifying potential therapeutic targets, thus guiding the development of more effective and personalized interventions.

Among the intervention possibilities that have been researched with good developmental potential, notable approaches include gene therapy (introduction of genetic material into affected cells to restore normal gene function) [11,12]; deep brain stimulation (DBS) (a technique involving the implantation of electrodes in the brain to provide electrical stimulation to specific areas, aiming to enhance cognitive function) [13]; and stem cell therapy (replacement of damaged cells and/or tissue regeneration with the potential to promote brain repair in individuals with intellectual disabilities) [7,14].

Behavioral interventions have shown effectiveness in clinical studies for the treatment of children with intellectual and developmental disabilities (IDD). These interventions are based on the principles of Applied Behavior Analysis (ABA) and have proven effective in developing appropriate behaviors and managing problematic behaviors. ABA is an evidence-based therapy that utilizes techniques of behavior modification and environmental contingency management to promote the learning of social skills, language, academic skills, and independence. The use of individualized programs, functional behavior analysis, and strategies of modeling and reinforcement has been effective in developing skills in children with IDD [15,16].

Another essential factor for the development of children with intellectual disabilities is social inclusion. It's a challenge to provide an inclusive environment where children are valued and have the opportunity to achieve their potential. Social inclusion not only promotes equality of rights and opportunities but also contributes to the emotional well-being, self-esteem, and autonomy of children with intellectual disabilities. Currently, social inclusion of children with intellectual disabilities is being encouraged worldwide as a means to ensure better social interaction and quality of life for this population [17,18].

Finally, it is important to highlight that in the context of the COVID-19 pandemic, children with intellectual disabilities have faced significant challenges. Containment measures such

as social distancing and school closures had a particularly significant impact on this vulnerable group. The interruption of in-person educational services and specialized therapies has resulted in additional difficulties in learning and development [19]. Moreover, many children with intellectual disabilities rely on structured routines and individualized support to meet their specific needs. The lack of access to these resources during the pandemic can lead to increased stress and anxiety, affecting their emotional and mental well-being. Furthermore, the pandemic has been a contributing factor to the increased risk of developing mental disorders [20-22].

The highlighted updates reflect the evolution of scientific knowledge and the quest for a more precise and comprehensive description of intellectual and developmental disabilities (IDD), aiming to improve identification, diagnosis, and access to appropriate interventions and supports for individuals with these conditions. As a result, we currently observe significant advancements in how society deals with intellectual disability, encompassing clinical aspects, treatments, and social considerations. However, there is still much room for improvement, and the scientific literature has shown potential breakthroughs in this area.

References

1. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (2013) 5th ed. Arlington, VA: American Psychiatric Association.
2. International Classification of Diseases, Eleventh Revision (ICD-11), World Health Organization (WHO) 2019/2021.
3. Morris-Rosendahl DJ, Crocq MA (2020) Neurodevelopmental disorders-the history and future of a diagnostic concept. *Dialogues Clin Neurosci* 22(1): 65-72.
4. Purugganan O (2018) Intellectual Disabilities. *Pediatr Ver* 39(6): 299-309.
5. Mulas F, Rojas M (2018) Disorder of intellectual development. Overlaps with Autism Spectrum Disorder and Attention Deficit Hyperactivity Disorder. *Medicina (B Aires)* 78 Suppl 2: 63-68.
6. Crawley JN, Fagiolini M, Harrison FE, Samaco R, Wozniak DF, et al. (2019) Behavioral analyses of animal models of intellectual and developmental disabilities. *Neurobiol Learn Mem* 165: 107087.
7. Biswas D, Cary W, Nolte JÁ (2020) PPP2R5D-Related Intellectual Disability and Neurodevelopmental Delay: A Review of the Current Understanding of the Genetics and Biochemical Basis of the Disorder. *Int J Mol Sci* 21(4): 1286.
8. Girault JB, Piven J (2020) The Neurodevelopment of Autism from Infancy Through Toddlerhood. *Neuroimaging Clin N Am* 30(1): 97-114.
9. Evans B (2020) Neurodevelopmental and cognitive disabilities: Historical overview. *Handb Clin Neurol*. 173: 7-14.
10. Oyama N, Vaneynde P, Reynhout S, Emily M Pao, Andrew Timms, et al (2023) Clinical, neuroimaging and molecular characteristics of PPP2R5D-related neurodevelopmental disorders: an expanded series with functional characterisation and genotype-phenotype analysis. *J Med Genet* 60(5): 511-522.

11. Symonds JD, McTague A (2020) Epilepsy and developmental disorders: Next generation sequencing in the clinic. *Eur J Paediatr Neurol* 24: 15-23.
12. Fagiolini M, Patrizi A, LeBlanc J, Jin LW, Maezawa I, et al (2020) Intellectual and Developmental Disabilities Research Centers: A Multidisciplinary Approach to Understand the Pathogenesis of Methyl-CpG Binding Protein 2-related Disorders. *Neuroscience* 445: 190-206.
13. Marini S, D'Agostino L, Ciamarra C, Gentile A (2023) Deep brain stimulation for autism spectrum disorder. *World J Psychiatry* 13(5): 174-181.
14. Zhao L, Li Y, Kou X, Benchi Chen, Jing Cao, et al (2022) Stem Cells from Human Exfoliated Deciduous Teeth Ameliorate Autistic-Like Behaviors of SHANK3 Mutant Beagle Dogs. *Stem Cells Transl Med* 11(7):778-789.
15. Lucock ZR, Sharp RA, Jones RSP (2018) Behavior-Analytic Approaches to Working with People with Intellectual and Developmental Disabilities who Develop Dementia: a Review of the Literature. *Behav Anal Pract* 12(1): 255-264.
16. Hustyi KM, Ryan AH, Hall SS (2023) A Scoping Review of Behavioral Interventions for Promoting Social Gaze in Individuals with Autism Spectrum Disorder and Other Developmental Disabilities. *Res Autism Spectr Disord* 100:102074.
17. Feaster D, Franzen A (2021) From stigma to acceptance: Intellectual and developmental disabilities in Central China. *J Intellect Disabil* 25(4): 507-526.
18. Kim KM, Qian X (2019) 'I feel valued': the experience of social networking site engagement among people with intellectual and developmental disabilities in South Korea. *Int J Dev Disabil* 67(6): 410-419.
19. Dimitriou D, Esposito G (2022) Management and support of individuals with developmental disabilities during the COVID-19 pandemic. *Res Dev Disabil* 125: 104228.
20. Aishworiya R, Kang YQ (2021) Including Children with Developmental Disabilities in the Equation During this COVID-19 Pandemic. *J Autism Dev Disord* 51(6): 2155-2158.
21. Oliveira FES, Trezena S, Dias VO, Martelli Júnior H, Martelli DRB (2023) Common mental disorders in Primary Health Care professionals during the COVID-19 pandemic period: a cross-sectional study in the Northern health macro-region of Minas Gerais state, Brazil, 2021. *Epidemiol Serv Saude* 32(1): e2022432.
22. Oliveira FES de, Costa ST, Dias VO, Martelli Júnior H, Martelli DRB (2022). Prevalence of mental disorders in health professionals during the COVID-19 pandemic: a systematic review. *J bras psiquiatr* 71(4): 311-320.



This work is licensed under Creative Commons Attribution 4.0 License
DOI: [10.19080/GJIDD.2023.12.555832](https://doi.org/10.19080/GJIDD.2023.12.555832)

Your next submission with Juniper Publishers will reach you the below assets

- Quality Editorial service
 - Swift Peer Review
 - Reprints availability
 - E-prints Service
 - Manuscript Podcast for convenient understanding
 - Global attainment for your research
 - Manuscript accessibility in different formats
- (Pdf, E-pub, Full Text, Audio)**
- Unceasing customer service

Track the below URL for one-step submission
<https://juniperpublishers.com/online-submission.php>